

In the Claims:

Please amend claims 1, 3-19, and 38. The claims are as follows:

1. (Currently amended) A system comprising multiple processing servers and a management server for managing the multiple processing servers, each processing server adapted to execute a program assigned thereto from among multiple programs for performing a requested job;

the management server comprising:

a first computer processor;

an execution direction generating unit for generating via the first computer processor, an execution direction, said execution direction including identification information identifying each of the multiple programs, input and/or output files for each of the multiple programs, and an execution order of the multiple programs for performing the requested job, said execution order identifying a first program of the multiple programs to be executed before any other program of the multiple programs is executed;

an input data sending unit for sending via the first computer processor, input data and the execution direction to a first processing server of the multiple processing servers for executing the first program with the input data;

a processing server information storing unit for storing via the first computer processor, identification information identifying each program of the multiple programs and identification information on each processing server for executing the program assigned to each processing server;

an inquiry responding unit for acquiring via the first computer processor, identification information from the processing server information storing unit and for sending the identification information to an inquiring processing server of the multiple processing servers in response to an inquiry for said identification information received from the inquiring processing server after the inquiring processing server has completed execution of the program assigned thereto, said identification information identifying a next processing server to execute a next program included in the execution direction; and each processing server of the multiple processing servers comprising:

a second computer processor;

a program executing unit for executing via the second computer processor, the assigned program using received input data and for updating the input data following said executing the assigned program;

a processing server selecting unit for sending via the second computer processor, to the management server, an inquiry for identification information identifying a next processing server to execute the next program included in the execution direction after said each processing server has completed execution of the program assigned thereto; and

an input data transferring unit for sending via the second computer processor, to the next processing server identified in the identification information received by the processing server selecting unit from the management server in response to said inquiry, the received execution direction and updated input data.

2. (Canceled)

3. (Currently amended) The system of claim 1,

wherein each processing server of the multiple processing servers further comprises a caching unit for caching via the second computer processor, said identification information of said next processing server which the processing server selecting unit of said each processing server has acquired as a result of said inquiry;

wherein the identification information is cached by the caching unit; and

wherein the processing server selecting unit selects via the second computer processor, the next processing server to execute the next program.

4. (Currently amended) The system of claim 1,

wherein in response to receiving the input data, the program executing unit sends via the second computer processor, a receiving notification indicating that input data has been received to the management server, and in response to terminating execution of the assigned program, the program executing unit sends an termination notification indicating that execution of the assigned program has been terminated;

wherein the processing server information storing unit stores via the first computer processor, ~~executability~~ executability information based on the receiving notification and the termination notification on whether or not it is possible for each processing server of the multiple processing servers to newly receive input data and execute its assigned program; and

wherein the inquiry responding unit selects via the first computer processor, the next processing server to execute the next program.

5. (Currently amended) The system of claim 4,

wherein the management server further comprises a program activating unit for, on condition that more than a predetermined percentage of the processing servers are not capable of newly receiving input data and executing the next program, activating via the first computer processor, the next program on one processing server which has not activated the next program; and

wherein the inquiry responding unit sends via the first computer processor, identification information of the one processing server on which the next program has been activated by the program activating unit.

6. (Currently amended) The system of claim 1,

wherein each processing server of the multiple processing servers comprises:

a history storing unit for storing via the second computer processor, history of the input data and the execution direction sent by the input data transferring unit to the processing server; and

a fault occurrence determining unit for determining via the second computer processor, whether or not any fault has occurred in execution of a program on a sending-destination processing server to which the input data transferring unit has sent the updated input data and the execution direction;

wherein in response to determining by the fault occurrence determining unit that said any fault has occurred, the processing server selecting unit selects via the second computer processor, a different processing server for executing the next program to be executed next; and

wherein the input data transferring unit acquires via the second computer processor, the input data and the execution direction from the history storing unit to send the input data and the execution direction to the different processing server selected by the processing server selecting unit.

7. (Currently amended) The system of claim 6,

wherein in response to receiving the input data, the program executing unit sends via the second computer processor, a receiving notification indicating that input data has been received from the management server,

wherein in response to terminating execution of the assigned program, the program executing unit sends via the second computer processor, an termination notification to the management server indicating that execution of the assigned program has been terminated; and

wherein the management server further comprises a fault occurrence notification sending unit for, if the receiving notification is received from any processing server and, after that, the termination notification is not received within a predetermined reference processing time from said any processing server, sending via the first computer processor, a fault occurrence notification indicating that a fault has occurred in execution of a program on said any processing server to a sending-source processing server which has sent the input data to said any processing server; and

wherein the fault occurrence determining unit determines via the second computer processor, if receiving the fault occurrence notification, that a fault has occurred in execution of a

program on a sending-destination processing server to which the input data transferring unit has sent the updated input data and the execution direction.

8. (Currently amended) The system of claim 6,

wherein in response to receiving the input data and execution direction by a sending-destination processing server, on determining that it is impossible to execute a program, the program executing unit of the sending-destination processing server sends via the second computer processor, a refusal notification indicating refusal of the input data to a sending-source processing server which has sent the input data and the execution direction to the sending-destination processing server; and

wherein in response to receiving the refusal notification from the sending-destination processing server, the fault occurrence determining unit of the sending-source processing server determines via the second computer processor, that a fault has occurred in execution of a program on the sending-destination processing server.

9. (Currently Amended) The system of claim 6, wherein the management server further comprises a deletion directing unit for, on condition that the job is completed by execution of the multiple programs, causing via the first computer processor, the input data and the execution direction to be deleted from the history storing section of each processing server of the multiple processing servers.

10. (Currently amended) The system of claim 6, wherein the processing server selecting unit of each processing server of the multiple processing servers selects via the second computer processor, from among processing servers activating a program to be executed next with the updated input data, a processing server which communicates with the processing server with a higher communication speed as the different processing server in preference to a server with a lower communication speed.

11. (Currently amended) The system of claim 1, wherein each processing server of the multiple processing servers further comprises:

a history storing unit for storing via the second computer processor, history information on data on the processing server which the program executing unit has changed by executing the program, in association with information which enables restoration to the state before the program executing unit has changed; and

a change restoring unit for via the second computer processor, if a fault has occurred in execution of a program on a sending-destination processing server to which the input data transferring unit has sent the updated input data and execution direction, restoring data changed by the program executing unit to the original state of the changed data based on the history information in the history storing unit.

12. (Currently amended) The system of claim 1, wherein the management server further comprises a program activating unit for detecting via the first computer processor, each of programs to be executed for and after the second time using the input data, based on the

execution direction, and activating each of the detected programs on any processing server different from the sending-destination server of the input data sending unit.

13. (Currently amended) The system of claim 12,

wherein the program executing unit of each processing server of the multiple processing servers notifies via the second computer processor, the management server of throughput required for execution of a program in the past; and

wherein the program activating unit of the management server activates via the first computer processor, on condition that the past throughput of a program notified by the program executing unit exceeds the maximum throughput to be processed by a processing server already activating the program, the program on any processing server different from the sending-destination server of the input data sending unit.

14. (Currently amended) The system of claim 1, wherein the management server further comprises a program activating unit for detecting via the first computer processor, each of programs to be executed using the input data and, for each of the detected programs, on condition that throughput required for the program to be executed with the input data exceeds the maximum throughput to be processed by a processing server already activating the program, activates the program on any processing server different from the sending-destination server of the input data sending unit.

15. (Currently amended) The system of claim 1, wherein on condition that the program executing unit does not receive the input data and execution direction within a predetermined reference waiting time after receiving input data and execution direction, the program executing unit stops execution via the second computer processor, of a program by the processing server that is executing the program.

16. (Currently amended) The system of claim 1, wherein the management server further comprises a processing server changing unit for, on condition that the usage rate of computation resources to be used for execution of a program by the program executing unit is below a predetermined reference usage rate, causing via the first computer processor a different processing server with a less maximum throughput than that of the processing server to execute the program.

17. (Currently amended) The system of claim 1, wherein in response to receiving input data and execution direction by a sending-destination processing server, the program executing unit detects via the second computer processor, that there still exists a program which should have been already executed based on received execution direction, and executes the detected program on condition that it is possible for the sending-source processing server to execute the program.

18. (Currently amended) The system of claim 1,
wherein the input data transferring unit of each processing server of the multiple processing servers creates via the second computer processor, a digital signature of the updated

input data or the execution information to send the created digital signature in association with the input data and execution direction to be covered by the digital signature; and

wherein the program executing unit of a processing server executes via the second computer processor, a program on condition that the digital signature is correctly verified.

19. (Currently amended) A management server for managing multiple processing servers, each processing server adapted to execute a program assigned thereto from among multiple programs for performing a requested job, the management server comprising:

a computer processor;

an execution direction generating unit for generating via the computer processor, an execution direction, said execution direction including identification information identifying each of the multiple programs, input and/or output files for each of the multiple programs, and an execution order of the multiple programs for performing the requested job, said execution order identifying a first program of the multiple programs to be executed before any other program of the multiple programs is executed;

an input data sending unit for sending via the computer processor, input data and the execution direction to a first processing server of the multiple processing servers for executing the first program with the input data;

a processing server information storing unit for storing via the computer processor, identification information identifying each program of the multiple programs and identification information on each processing server for executing the program assigned to each processing server;

an inquiry responding unit for acquiring via the computer processor, identification information from the processing server information storing unit and for sending the identification information to an inquiring processing server of the multiple processing servers in response to an inquiry for said identification information received from the inquiring processing server after the inquiring processing server has completed execution of the program assigned thereto, said

identification information identifying a next processing server to execute a next program included in the execution direction.

20-25. (Canceled)

26. (Previously Presented) A method for performing a requested job by a system that comprises multiple processing servers and a management server for managing the multiple processing servers, each processing server adapted to execute a program assigned thereto from among multiple programs for performing the requested job, said method comprising:

generating, by the management server, an execution direction, said execution direction including identification information identifying each of the multiple programs, input and/or output files for each of the multiple programs, and an execution order of the multiple programs for performing the requested job, said execution order identifying a first program of the multiple programs to be executed before any other program of the multiple programs is executed;

sending, by the management server to a first processing server of the multiple processing servers, the execution direction and input data for subsequent execution of the first program;

executing, by the first processing server, the first program using the input data as input, wherein said executing the first program results in said input data being updated;

after said executing the first program, sending, by the first processing server to the management server, an inquiry for identification information that identifies a second processing server to execute a second program included in the execution direction;

after sending the inquiry, receiving, by the first processing server from the management server, the identification information; and

sending, by the first processing server to the second processing server, the execution direction and the updated input data for subsequent execution of the second program.

27. (Previously Presented) The method of claim 26, further comprising after said receiving the execution direction and input data:

sending, by the first processing server to the management server, a receiving notification indicating that the first processing server has received the execution direction and input data sent by the management server.

28. (Previously Presented) The method of claim 26, further comprising after completion of said executing the first program:

sending, by the first processing server to the management server, a termination notification indicating that the first processing server has completed execution of the first program.

29. (Previously Presented) The method of claim 26, wherein after said sending, by the first processing server to the second processing server, the execution direction and the updated input data for subsequent execution of the second program, the second processing server is designated as a current processing server, the second program is designated as a current program, and the updated input data is designated as current input data, and the method further comprises

executing a loop that comprises at least one iteration such that executing the loop comprises performing each iteration of the at least one iteration, wherein each iteration when performed is designated as a current iteration, and wherein performing each iteration of the loop comprises:

if the current processing server is unable to execute the current program then not executing the current program by the current processing server, otherwise initiating execution of the current program by the current processing server using the current input data as input which results either in completion of executing the current program by the current processing server with the current input data being updated or an occurrence of a fault during said executing the current program by the current processing server;

if said execution of the current program by the current processing server is initiated and completed, then after completion of executing the current program by the current processing server: sending, by the current processing server to the management server, either a completion notification to indicate that performance of the requested job has been completed or an inquiry for identification information that identifies a next processing server to execute a next program included in the execution direction;

if the inquiry has been sent then after said sending the inquiry and receipt thereof by the management server:

sending, by the management server to the current processing server, the identification information; and

sending, by the current processing server to the next processing server, the execution direction and the updated input data for subsequent execution of the next program to end the current iteration, wherein for the next iteration is to be performed: the

next processing server is designated as the current processing server, the next program is designated as the current program, and the updated input data is designated as the current input data.

30. (Previously Presented) The method of claim 29, wherein during an individual iteration of the at least one iteration said execution of the current program by the current processing server is initiated and completed.

31. (Previously Presented) The method of claim 30, wherein the individual iteration is the last iteration of the at least one iteration and during said last iteration after said completion of said executing the current program by the current processing server, said sending the completion notification by the current processing server to the management server is performed.

32. (Previously Presented) The method of claim 30, wherein during the individual iteration after said completion of said executing the current program by the current processing server is performed, said sending the inquiry by the current processing server to the management server is performed.

33. (Previously Presented) The method of claim 29, wherein during an individual iteration of the at least one iteration either the current processing server is unable to execute the current program or said execution of the current program by the current processing server is initiated such that

said fault occurs during said executing the current program by the current processing server, and wherein the method further comprises during said individual iteration:

sending, by the current processing server to a prior processing server that had sent the execution direction and the updated input data to the current processing server, a refusal notification indicating refusal of the updated input data;

sending, by the prior processing server to the management server, an inquiry for different identification information that identifies a different processing server to execute the next program included in the execution direction;

sending, by the management server to the prior processing server, the different identification information; and

sending, by the prior processing server to the different processing server, the execution direction and the updated input data for subsequent execution of the next program during the individual iteration such that the different processing server is designated as the current processing server during the individual iteration.

34. (Previously Presented) The method of claim 33, wherein during the individual iteration, the current processing server is unable to execute the current program.

35. (Previously Presented) The method of claim 33, wherein during the individual iteration, said execution of the current program by the current processing server is initiated such that said fault occurs during said executing the current program by the current processing server.

36. (Previously Presented) The method of claim 29, wherein during an individual iteration of the at least one iteration said execution of the current program by the current processing server is initiated such that said fault occurs during said executing the current program by the current processing server,

wherein the current processing server is unable to send a refusal notification to a prior processing server that had sent the execution direction and the updated input data to the current processing server, wherein the refusal notification if sent would have indicated refusal of the updated input data, and wherein the method further comprises during said individual iteration:

- determining, by the management server, that said fault has occurred;

- sending, by the management server to the prior processing server, a fault occurrence notification indicating that said fault has occurred;

- selecting, by the management server a different processing server to execute the next program included in the execution direction; and

- sending, by the prior processing server to the different processing server, the execution direction and the updated input data for subsequent execution of the next program during the individual iteration such that the different processing server is designated as the current processing server during the individual iteration.

37. (Previously Presented) The method of claim 29, wherein during an individual iteration of the at least one iteration said execution of the current program by the current processing server is initiated such that said fault occurs during said executing the current program by the current processing server,

and wherein the method further comprises during said individual iteration:

determining, by the management server, that said fault has occurred and that the requested job cannot be performed by avoiding said fault; and

sending, by the management server to all prior servers that have performed a prior execution of a program of the multiple programs during any prior iteration of the at least one iteration, a restoration directive to restore all data changed during said prior execution by said all prior servers.

38. (Currently amended) A system comprising a plurality of processing servers and a managing server for managing the multiple processing servers, said system adapted to perform the method of claim 26 via a first computer processor comprised by the managing server and a second computer processor comprised by each processing server of the plurality of processing servers, wherein the plurality of processing servers consists of the multiple processing servers, and wherein the managing server consists of the management server.

39. (Previously Presented) Storage media, comprising a computer readable control programs embodied therein, said control programs adapted to be executed by a managing server and a plurality of processing servers to perform the method of claim 26, wherein the plurality of processing servers consists of the multiple processing servers, and wherein the managing server consists of the management server.